

An "observer" at Sealkote states that he saw meteors from midnight of the 13th to the dawn of the 14th inst.

There is a report that the meteors were seen at Lahore "to clash against each other and mount upwards again."

27th Nov. 1866,
Kishnaghur.

The Meteors of December 12-13, 1866, as observed at Millbrook, Tuam. By J. Birmingham, Esq.

Though the December meteors could not be compared to the wondrous display of the previous month, still in scientific interest they may be considered quite equal to their more brilliant precursors; and as I have not seen them noticed by other observers I am the more induced to offer the following brief account of them for the consideration of the Society.

There was great rain for two hours before 9 P.M. on the 12th, when it began to clear, and at 9^h 15^m I saw a small meteor going south from *Gemini*. Within the next fifteen minutes I observed nine others shown by alignments to radiate from within a circle about 3° in diameter, with its centre in Right Ascension 107° and North Polar Distance 71°. However, a slightly elongated and almost stationary meteor which appeared at the intersection of lines joining β and ϵ , δ and θ *Geminorum* would seem to indicate a somewhat higher radiant; and, as the night advanced, a few of the meteors proceeded from other places in the neighbourhood of *Gemini*. Regarding the tangent of the Earth's course on the night in question as directed towards 171° of longitude, it will be seen that the December radiant shows an orbit differing widely in relation to our own from that of the November group. Up to 1^h 25^m on the morning of the 13th I counted 260 meteors diverging to every point in the heavens, but the greater number fell towards the horizon between the south and the north-west. Unlike the full, glowing disks that traversed the sky on the 14th November, the present meteors might be described as having a *cindery* aspect, with, however, some notable exceptions. They were mostly of a bluish white colour; and red was to be found only among those that showed no connexion with the radiating movement, and of which I counted twenty. Though many appeared as trainless sparks, they generally showed tails that differed from those of the November meteors, as they were always of the same colour as the nuclei and left no cloudy traces after their extinction—facts suggestive of the idea that they were merely optical. One that was brighter than *Sirius* passed close to that star, as did another with equal

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magnitude and with a serpentine course. There was no well-marked time of maximum display, but there seemed to be alternate periods of repose and activity.

After *Gemini* passed the meridian the sky became overcast; and, though I watched closely for openings in the clouds, I saw nothing until 3^h 8^m, when an immense fire-ball flashed through a misty break in *Leo*, and all again was darkness. Soon after this it partially cleared towards the east, and from time to time I was able to catch sight of a meteor moving in that direction. At about five o'clock there was heavy rain that continued for half-an-hour; and at 5^h 53^m I remarked one meteor falling from the direction of *Gemini* through *Hydra*. The west and north were still clouded, and I saw no more until *Saturn* appeared enveloped in the breaking day, when I left off observing.

As there were some of those meteors that might be well distinguished from the rest, I was careful to mark their places on a map, hoping that they might, perhaps, be identified by other observers, and have their height determined

The most remarkable appeared as follows:—

G.M.T.
1866,
Dec. 12-13.

- | h | m | |
|----|----|--|
| 10 | 18 | P.M. Close by Procyon, in a line from δ Geminorum; as large as Sirius. |
| 10 | 53 | Through Præsepe, in a line parallel with Castor and Pollux. |
| 11 | 11 | From Procyon, in line produced from direction of β Aurigæ. |
| 11 | 51 | Precisely over g , and between ζ and γ Leonis. |
| 0 | 11 | A.M. From close below α Ursæ, across ν . |
| 1 | 14 | Near Sirius, between μ and γ ; larger than Sirius. |
| 1 | 35 | From ϵ , in a curve between η and γ Leonis. |
| 4 | 30 | From Draco, across the Camelopard to the true Pole, in a perpendicular to the Pole and ζ Ursæ Min. |
| 4 | 36 | In Corona, pointing from near δ Bötis to near δ Coronæ. |

Place of observation, Lat. $53^{\circ} 37' 43''$, Long. $8^{\circ} 53'$ (approximate).

On the Compatibility of the Retrograde Orbit of the November Meteors with the Nebular Theory. By John Hippisley, F.R.S.

In the *Monthly Notices* for December 1866, Sir John Herschel, having arrived at the conclusion that the orbital motion of the November meteors is *retrograde*, leaves it to the advocates of the nebular hypothesis to reconcile that fact with their theory.

The nebular hypothesis supposes that space was once,